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#3135
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# WATER QUALITY MEMORANDUM

Utah Coal Regulatory Program

March 23, 2010

TO: Internal File

THRU: James D. Smith, Permit Supervisor JDS 29 Mar 10

FROM: Steve Christensen, Environmental Scientist SC

RE: 2008 Second Quarter Water Monitoring, West Ridge Resources, West Ridge Mine, Task ID #3135

The West Ridge Mine is currently operational in the Book Cliff Mountain range of Carbon County, UT. Water monitoring data is submitted quarterly to the Division EDI database. Beginning on page 7-34 of the approved Mining and Reclamation Plan (MRP), water monitoring protocols and sampling requirements are provided for surface water, ground water, monitoring wells and UPDES outfalls in Tables 7-1, 7-2, 7-3 and 7-4 respectively.

**1. Was data submitted for all of the MRP required sites?** YES ☒ NO ☐

***Springs***

*The approved MRP outlines the monitoring of 10 springs. Four of the springs (SP-12, SP-13, SP-15 and SP-16) discharge from the lower slopes of West Ridge in Whitmore Canyon. Two springs (WR-1 and WR-2) discharge from the upper slope of West Ridge in Whitmore Canyon. One spring (SP-8) discharges in the upper drainage of C Canyon. Hanging Rock Spring (S-80) is located near the northwest corner of the permit area and discharges from the east slopes of Whitmore Canyon. Spring 101 monitors Little Spring at the bottom of West Ridge. Spring 102 is located within Spring Canyon.*

Data was submitted for all 10 spring monitoring sites.

***Streams***

*The approved MRP outlines the monitoring of 12 stream sites. Grassy Trail Creek is the only perennial stream in the permit and adjacent areas. Operational sampling is required quarterly for six stream sites (ST-3, ST-8, ST-9, ST-10, ST-13 and ST-15). Four sites (ST-5, ST-6, ST-6A and ST-7) are equipped with automatic samplers that are required to be checked*

*following precipitations events. Sites ST-11 and ST-12 were added to the water-monitoring program based upon field inspections conducted in 2005. The field inspections were conducted as part of a proposed lease expansion by the Permittee. At the time of the inspections, the Bear Canyon drainage had exhibited measurable flow. As a precaution, sites ST-11 and ST-12 were established within that drainage. Since that time (summer of 2005) neither site has produced appreciable/measurable flow. However, the sites remain as part of the surface water monitoring program and are inspected quarterly.*

Data was submitted for all 12 stream monitoring sites.

***Wells***

*Operational sampling is required quarterly for one groundwater monitoring well (Site DH 86-2).*

Monitoring well DH 86-2 was sampled during this quarter and all required data submitted.

***UPDES***

Operational sampling is required monthly for two active UPDES sites (Permit # UT0025640). Site D001 is the mine sites primary sediment pond discharge to the ephemeral 'C' Canyon drainage. Site D002 is the mine-water discharge to the ephemeral 'C' Canyon drainage. Specific limitations and self-monitoring requirements as outlined in the UPDES permit are presented in the table below:

| Effluent Characteristics | Effluent Limitations |
|---|---|
| Flow, MGD (million gallons per day) | 1.0 |
| Total Suspended Solids (TSS), ppm | 70 |
| Total Iron, ppm | 1.3 |
| Oil & Grease, ppm | 10 |
| Total Dissolved Solids (TDS), ppm | 2,000 |
| pH | 9 |

The Permittee submitted all required samples per the terms of the UPDES discharge permit.

**2. Were all required parameters reported for each site?** YES ☒ NO ☐

**Surface Water Monitoring Sites:** All required parameters were reported for sites with

measurable flow.

**Groundwater and Well Monitoring Sites:** All required parameters were reported for sites that measurable flow.

**UPDES:** Site D001 did not produce any discharge during this quarter. All required parameters were reported for Site D002.

**3. Were any irregularities found in the data?** YES ☒ NO ☐

**Surface Water Monitoring Sites-** The following irregularities were found in the reported surface water monitoring data:

**ST-5-** Flow was reported above two standard deviations (STD). The mean value for flow at this monitoring site is 133.22 gallons per minute (gpm). A value of 897.6 gpm was reported for this quarter. This is the second consecutive quarter where site ST-5 has produced elevated flow levels. Discussions with the Permittee revealed that an increase in encountered mine-water is in all likelihood, the cause. In addition, spring snowmelt from the B Canyon drainage would have increased flow values at ST-5. Erratic flow values have been historically reported at this monitoring site due to changes in encountered flow conditions in the underground workings.

**Groundwater Monitoring Sites-** Several irregularities were found in the reported groundwater monitoring data:

**SP-102-** Dissolved Sodium (D-Na) was reported above two STD for the quarter. The mean value for D-Na at the site is 42.15 parts per million (ppm). A value of 49.75 ppm was reported.

**SP-15-** Sulfate (SO4) was reported above two STD. The mean value for SO4 at the site is 146 ppm. The reported value for this quarter was 146 ppm.

Additionally, total dissolved solids (TDS) were reported above two STD. The mean value for TDS is 418.96 ppm. The reported value for this quarter was 508 ppm.

**SP-16-** Water temperature was reported above two STD for the quarter. The mean value for temperature at this site is 8.97 degrees Fahrenheit. The reported value was 15 degrees Fahrenheit. It's likely that the increase in temperature was due to the ambient temperature at the time of data collection (June 16$^{th}$, 2008).

**WR-2-** D-Na was reported above two STD. The mean value is 20.55 ppm. The reported value was 33.77 ppm.

**UPDES Sites-**

Site D001 (primary sediment pond at mine site) did not discharge this quarter.

During the 1st quarter of 2008, Site D002 (mine-water discharge) reported a total suspended solids (TSS) value of 103 ppm, which exceeded the 70 ppm standard established in the Permittee's UPDES Discharge Permit (# UT0025640). However, based upon 3 reported sampling events, the TSS levels have returned to well within compliant levels (7 ppm, 18 ppm and 14 ppm respectively). Based upon discussions with the Permittee, a sump pump in the underground workings was inadvertently allowed to pump untreated water to the surface. The condition has been corrected as evidenced by the reported data. (See chart below).

**4. On what date does the MRP require a five-year re-sampling of baseline water data.**

On page 7-35 of the approved MRP, the Permittee commits to collecting baseline samples "*from each spring in the monitoring program during the low flow (fall) sampling and from each stream monitoring sites during low flow every five years beginning with the first mid-term review.*"

The Division initiated the last mid-term review on November 9th, 2006. As such, baseline sampling of ground and surface water sites will be required during the 3rd quarter of 2011.

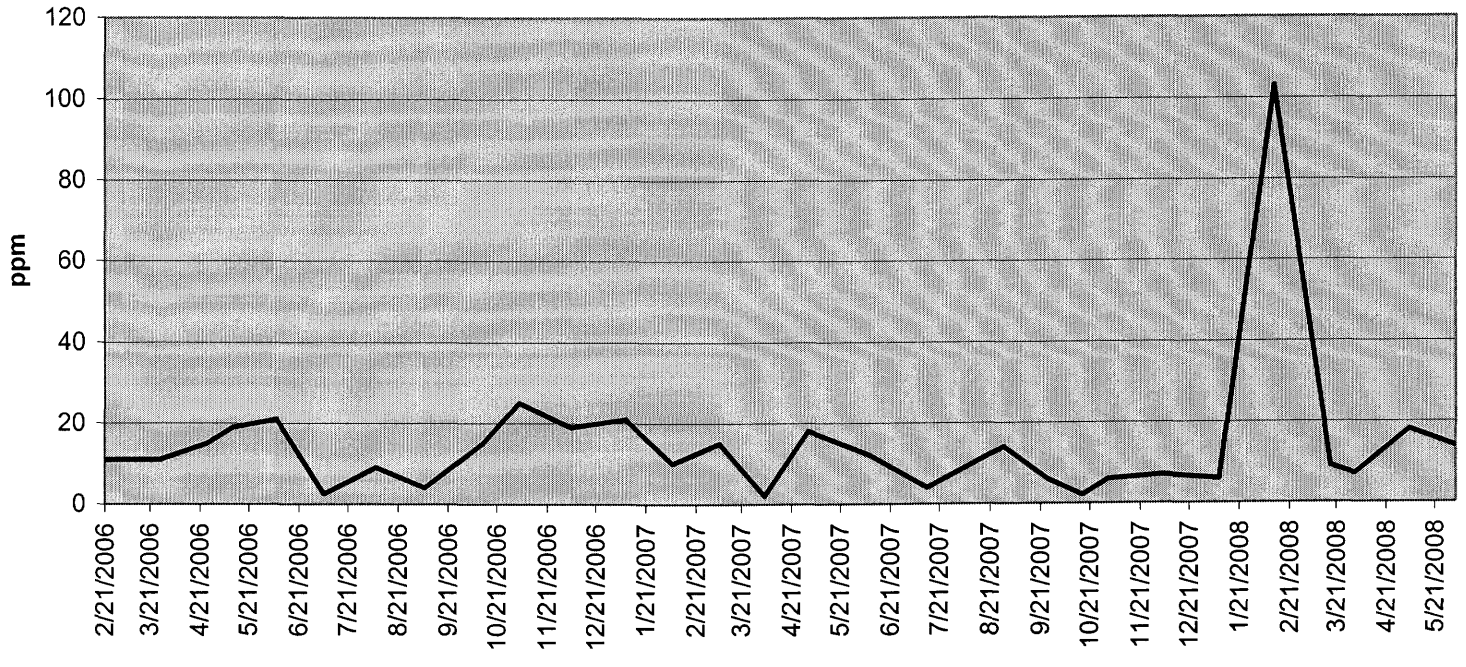
**5. Based on your review, what further actions, if any, do you recommend?**

Continue to monitor the data irregularities cited above for any trends.

**6. Does the Mine Operator need to submit more information to fulfill this quarter's monitoring requirements?** YES ☐ NO ☒

**7. Follow-up from last quarter, if necessary. Did the Mine operator submit or provide an explanation for missing and/or irregular data?** YES ☐ NO ☒

## UPDES Outfall D002: TSS (ppm)




## ST-5: Flow Values